What's Going On?
How What Happens in Active Learning Classrooms (ALCs) Matters

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OVERVIEW

Since 2007, the Academic Technology research team at the University of Minnesota has been investigating the impact of the University's Active Learning Classrooms (ALCs) on teaching practices and learning outcomes.

These formal learning environments are:

- Outfitted with large round tables, laptop connections, student display panels, multiple projection screens, and 360° markerboards;
- Modeled on North Carolina State's SCALE-UP and Massachusetts Institute of Technology's TEAL projects;
- Designed with an emphasis on innovative and flexible construction; and
- Designed to encourage new pedagogical approaches.

With the completion of the Student Teaching & Student Services (STSS) building in 2010, the University presently supports 16 ALCs with capacities that range from 27 to 126 students.

METHODS

In 2012, using closely aligned instruments, we surveyed students (N = 736) and faculty (N = 21) in 22 ALC courses. We also conducted regular observations of four ALC courses using a validity- and reliability-tested protocol. Additionally, we surveyed (N = 217) and observed a large lecture format chemistry course conducted in a traditional, theater-style classroom.

RESULTS

Our current results build upon our previous findings that ALCs have a significant and positive impact on student learning as measured by course grades with normalized gains of between 17% and 24% **(Figure 1)**. Longitudinally, we have observed that students increasingly perceive ALCs to have a significant and positive impact on their learning experience in terms of Engagement, Enrichment, and Flexibility. We also find that their evaluation of instructors' Effective Use of the space and the Course and Classroom Fit rise concomitantly **(Figure 2)**.

In keeping with our previous findings, students in the ALCs perceive significantly higher levels of Engagement, Enrichment, Flexibility, Confidence, and support of Student Learning Outcomes than students in traditional classrooms, but continue to perceive no significant gaps between their courses and the spaces in which they are held **(Figure 3)**. However, on average, the perception was that instructors teaching in ALCs did not use the classroom as effectively as instructors in traditional classrooms.

For the first time, we surveyed students in both the ALCs and traditional classrooms to measure their perception of the frequency of learning activities. These activities included small and large group work, the public display of individual and group work, instructor consultation at the individual and group level, as well as the number of times students acted as instructors. In every case, students in the ALC perceived a significanty greater number of these learning activities than their counterparts in the traditional lecture theater **(Figure 4)**.

When comparing undergraduate (N = 674) to graduate (N = 62) students in the ALCs, we found no significant differences on any of our theoretical measures **(Figure 5)**. With the exception of the frequency with which students reported small group work and group consultations, we also found no significant differences in the reported numbers of learning activities between graduate and undergraduate students in ALCs **(Figure 6)**.

For the first time, we have enough variation in the type of courses to explore how students in different academic divisions — humanities (N = 104), social sciences (N = 333), sciences (N = 444) — responded to our theoretical constructs. Students in the social sciences reported their perceptions of the impact of the room more positively than the humanities on all seven measures and more positively than the sciences in all measures except Effective Use **(Figure 7)**. Science students' perceptions of the impact of the room were greater than the humanities in only three instances: Enrichment, Room/Course Fit, and Effective Use.

Because the STSS building was constructed primarily for science teaching, we were interested in the difference in perception between science and non-science courses. In terms of our theoretical constructs, this contrast produced mixed results. In all constructs, students in science courses rated the impact of the space significantly lower than non-science students (N = 437), with the exception of Effective Use which they rated significantly higher and Room/Course Fit for which there is no statistical difference **(Figure 8)**. However, science students consistently reported higher frequencies of learning activities (e.g., group work, consultation, work displayed, etc.) than non-science students **(Figure 9)**.

Figure 1. Expected versus Actual Grades in Three ALC Courses

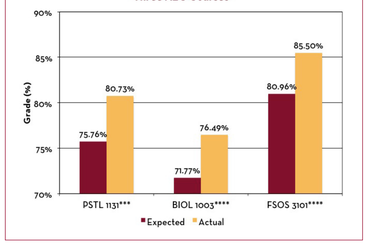


Figure 2. Longitudinal Student Perceptions of Impact of ALCs on Five Theoretical Constructs

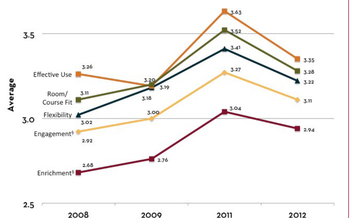


Figure 3. Difference of Means Tests for Student Perceptions of ALC Impact, by Room Type§

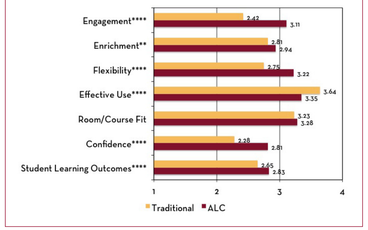


Figure 4. Comparison of Frequencies of Learning Activities, by Room Type

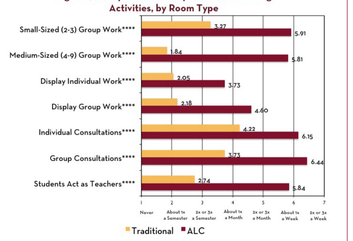


Figure 5. Difference of Means Tests for Student Perceptions of ALC Impact, by Course Level§

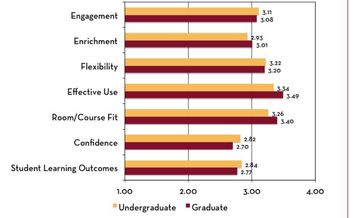


Figure 6. Comparison of Frequencies of Learning Activities, by Course Level

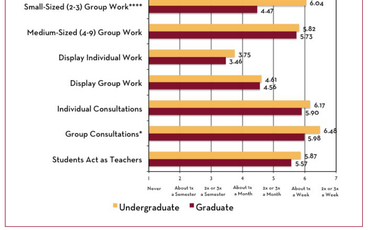


Figure 7. Comparison of Means of Student Perceptions of ALC Impact, by Academic Division§

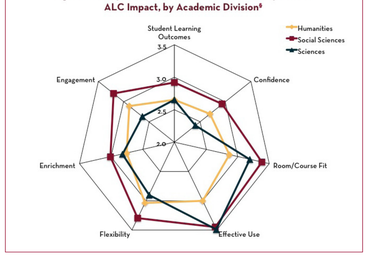


Figure 8. Difference of Means Tests for Student Perceptions of ALC Impact (Science vs. Non-Science)§

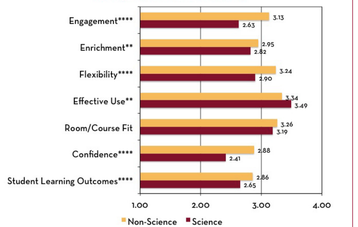
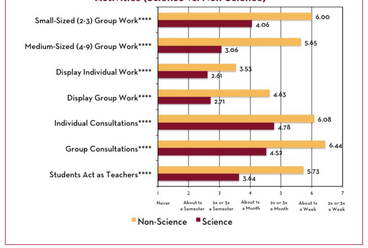


Figure 9. Comparison of Frequencies of Learning Activities (Science vs. Non-Science)



FURTHER RESEARCH

Baepler, P., Walker, J.D., & Brooks, D.C., Eds. (2014). Active Learning Classrooms. *New Directions for Teaching and Learning*. Vol. 137.

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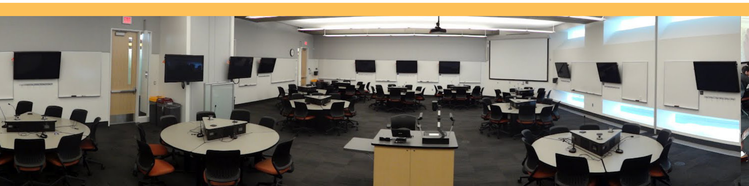
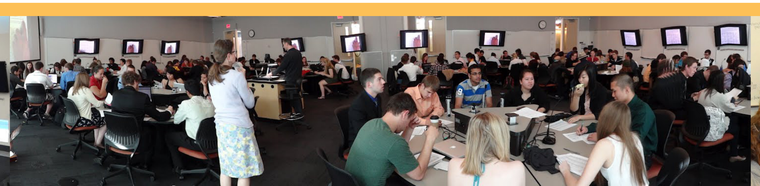
NOTES

*p < .05; **p < .01; ***p < .001; ****p < .0001

§Theoretical constructs employ a four-point Likert scale, where 1 = Strongly Disagree & 4 = Strongly Agree.

We would like to thank the Office of Classroom Management, the Office of Institutional Research, the Office of Measurement Services, the Center for Teaching and Learning, and Robert McMaster, Vice Provost and Dean of Undergraduate Education at the University of Minnesota, Twin Cities, for their support and collaboration throughout this research.





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